

IN THE CLAIMS:

Claims 1 through 12 are pending in this application. Please amend Claims 1, 5, 6 and 7, and add new Claims 8 through 12, as follows:

1. (Currently Amended) An avalanche photodiode, comprising:
an absorption layer absorbing light to create carriers; and
a multiplication layer multiplying the created carriers,
wherein
the multiplication layer is formed of Si and the absorption layer is formed of a compound semiconductor, and wherein
a semiconductor interface layer having a wider band-gap than that of the absorption layer is formed between the multiplication layer and the absorption layer,
the semiconductor interface layer being securely fused with the multiplication layer.
2. (Original) An avalanche photodiode according to claim 1, wherein the absorption layer is formed of an InGaAs mixed crystal or InGaAlAs mixed crystal or InGaAsP mixed crystal, and the semiconductor interface layer is formed of the InGaAlAs mixed crystal or InGaAsP mixed crystal.
3. (Original) An avalanche photodiode according to claim 1, wherein the absorption layer is formed of an InGaAs mixed crystal or InGaAlAs mixed crystal or InGaAsP mixed crystal, and the semiconductor interface layer is formed of InP or GaAs.
4. (Original) An avalanche photodiode according to claim 1, wherein the absorption layer is formed of a semiconductor containing Sb.
5. (Currently Amended) An avalanche photodiode according to claim 1, wherein a junction between the multiplication layer and the semiconductor interface layer is formed by [[a]] fusion.
6. (Currently Amended) An optical module mounting an avalanche photodiode, said avalanche photodiode comprises:
an absorption layer absorbing light to create carriers; and

a multiplication layer multiplying the created carriers,
wherein

the multiplication layer is formed of Si and the absorption layer is formed of a compound semiconductor, and wherein

a semiconductor interface layer having a wider band-gap than that of the absorption layer is formed between the multiplication layer and the absorption layer, the semiconductor interface layer being securely fused with the multiplication layer.

7. (Currently Amended) An optical receiver mounting an avalanche photodiode, said avalanche photodiode comprises:

an absorption layer absorbing light to create carriers; and
a multiplication layer multiplying the created carriers,

wherein

the multiplication layer is formed of Si and the absorption layer is formed of a compound semiconductor, and wherein

a semiconductor interface layer having a wider band-gap than that of the absorption layer is formed between the multiplication layer and the absorption layer, the semiconductor interface layer being securely fused with the multiplication layer.

8. (New) A method of manufacturing an avalanche photodiode, comprising the steps of:

forming a silicon multiplication layer on a silicon substrate;

forming, on a substrate, an absorption layer composed of a compound semiconductor and a semiconductor interface layer having a wider band-gap than that of the absorption layer; and

fusing the silicon multiplication layer and the semiconductor interface layer.

9. (New) The method of manufacturing an avalanche photodiode according to claim 8, wherein the absorption layer is formed of an InGaAs mixed crystal or InGaAlAs mixed crystal or InGaAsP mixed crystal, and the semiconductor interface layer is formed of the InGaAlAs mixed crystal or InGaAsP mixed crystal.

10. (New) The method of manufacturing an avalanche photodiode according to claim 8, wherein the absorption layer is formed of an InGaAs mixed crystal or InGaAlAs mixed crystal or InGaAsP mixed crystal, and the semiconductor interface layer is formed of InP or GaAs.
11. (New) The method of manufacturing an avalanche photodiode according to claim 8, wherein the absorption layer is formed of a semiconductor containing Sb.
12. (New) The method of manufacturing an avalanche photodiode according to claim 8, wherein a junction between the silicon multiplication layer and the semiconductor interface layer is formed by the fusion.